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Choosing the Right Power Valve for Your Holley Carburetor



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When it comes to tuning a Holley carburetor the power valve has always seemed a mystery to many. But, once you know how power-valves work, it's easy to select, troubleshoot, and install the right one for your application.

The power is a vacuum-operated fuel valve that is designed to enrich the fuel flow to the engine under varied vacuum conditions. It is located in the metering block, and opens at a set vacuum that is determined by the spring it contains. Depending on the spring in the power valve, this can occur at varying engine rpm and directs extra fuel into the carburetor's main power circuit. The valve itself is a small rubber diaphragm with a small coil spring. When opened, it allows fuel to flow through the calibrated opening in the metering block (power valve channel restrictor). This restrictor determines the amount of additional fuel delivered to the engine.



Engine vacuum is what actually operates a Holley power valve. The spring that is part of the power valve is the resistance to the diaphragm that only allows it to open at a certain vacuum reading. Spring pressure is what changes the actual operating range of the power valve.

To find out which power valve your high-performance engine needs, you first need to know the vacuum characteristics of your engine. Begin by hooking a vacuum gauge to an intake manifold-vacuum port. Warm up the engine and note the vacuum reading at idle. Automatic transmission equipped vehicles need to be in the Drive position for this test. Once you have a proper reading, divide the vacuum reading number in half. The divided number will determine the correct power valve that you need.

As an example, a vacuum reading at idle of 13-inches needs to be divided by two, which results in a number of 6.5. Therefore, you should have a number 65 Holley power valve installed in the carburetor. If your divided number falls on an even number, you should select the next lowest power valve number. For example, a vacuum reading of 8-inches, divided by two and you come up with a number of four. In this case, you would use a 35 power valve.

To know which power valve you have, all you need to do is look at it. Each power valve is stamped with a number that indicates the correct vacuum opening point. For example, a power valve with the number 65 stamped on it will open at 6.5 inches of engine vacuum. Many racers will instinctively remove the power valve and install a plug in its place. This is often done on hardcore race cars that don't see a lot of street duty. Basically, the power

valve is designed to help an engine to deliver a little better gas mileage, and with a race car, fuel mileage is not typically a priority.

However, if you decide to remove the power valve, then bigger main jets must be installed. Since the power valve is for fuel enrichment, if it is missing, the engine needs to get the extra, required fuel from somewhere. So, If you decide to do away with the power valve, you must increase the main jet sizes considerably (typically 6 – 10 jet sizes).



Knowing what power valve you have is as easy as reading numbers. The face of this power valve has the numbers 6 and 5 on it. That means that this valve opens at 6.5 inches of vacuum.

Stock engines typically have a high vacuum reading (10-18 inches at idle) and the Holley power valves with higher readings like 6.5 to 10.5 will work correctly. But, add a long duration non-stock camshaft or other performance related parts, you will soon find out that a stock-rated power valve is not your friend. This is because engine manifold vacuum is usually lowered with these performance parts, and this can cause the power valve to always be open, even at part throttle, leading to an overly rich air/fuel mixture. Holley makes performance style “standard” flow or a high flow power valve, which has a larger opening. If at all possible, avoid any “two-stage” power valve. These are designed more for economy minded users rather than performance enthusiasts.

Finally, most of the popular Holley carburetors incorporate a power valve blow-out protection system. This is a special check valve that is located in the base plate, expressly for this purpose. This check valve is designed to be normally open but will quickly close off the internal vacuum passage when a backfire occurs. Once closed, the check valve interrupts the pressure wave caused by the backfire, thus protecting the power valve.

If you have a carburetor older than 1992 (or you have experienced an extreme backfire) and expect a blown power valve, use this simple test. *TEST: At idle, turn your idle mixture screws (found on the side of the metering block) all the way in. If your engine dies the power valve is not blown.*



In a race-only application, some will remove the power valve from the carburetor, and install plugs. If the engine is only ever run at wide-open throttle, this is not a problem, but any street driving and your fuel economy will take a huge hit. Also, if you plug the power valve hole, you will need to increase your main jets by roughly 6-10 jet sizes.

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